LUND UNIVERSITY
School of Economics and Management

# Are they an advantage - or taken advantage of?

## A study of the dependence of migrant seasonal workers within the Swedish agriculture

**Axel Johansson**
Supervisor: Martin Nordin

NEKP01
Department of Economics
June 2021

**Abstract**

In 2019, migrant seasonal workers from outside the EU constituted approximately twenty percent of the hired workforce within the agricultural sector in Sweden. However, the total share of migrant seasonal workers is assumed to be even greater. During 2020 this figure dropped significantly due to the travel restrictions associated with the COVID-19 pandemic. According to the Federations of Swedish Farmers, this would lead to a shortage of labour harming the agricultural sector, as migrant seasonal workers were not allowed into Sweden. However, the production results reported for 2020 does not show any decline in production.

This thesis aims to investigate the dependence of migrant seasonal workers through two research questions; whether the number of migrant seasonal workers affect employment in the agricultural sector and whether the dependence on migrant seasonal workers is beneficial for the agricultural sector. This was done by fitting a fixed effect model on panel data from 2010 to 2019 for employment and the number of granted work permits in the agricultural sector for non-EU citizens. The findings suggest that the number of migrant seasonal workers has little to no effect on employment in the agricultural sector. Additionally, the results suggest that the structural transformation within the agricultural sector decreases its employment. As the number of farms decreases, the ones left increase in size and substitute labour with larger and more efficient machines. In the mean time they chose to depend on migrant seasonal workers to fill the void of labour during the labour intense periods of the year. However it can not be established whether or not the dependence of migrant seasonal workers is beneficial. It is argued that the dependence of migrant seasonal workers is related to the fact that migrant seasonal workers are cheap to employ rather than a domestic shortage of labour.

# Contents

# Chapter 1

# Introduction

During the past twenty years, the number of permanently employed people within the agricultural sector in Sweden has steadily declined (Statistics Sweden & Swedish Board of Agriculture 2020, Swedish Board of Agriculture 2017, 2021). At the same, the number of farms is decreasing (Karlsson 2017, Statistics Sweden & Swedish Board of Agriculture 2020). This development follows a global trend of structural transformation within the agricultural sector, where the most significant twenty percent of producers amount eighty percent of the farm output (Martin 2020). While the number of permanently employed has decreased in Sweden, the number of temporary employed has increased over the last ten years. Consequently, this has affected the labour market - Swedish farmers depend on migrant seasonal workers to fill the void of labour during the labour-intense periods of the year (Zachrison et al. 2015). In the vegetable industry alone, migrant seasonal workers constitute eighty percent of the total hired workforce (Zachrison et al. 2015).

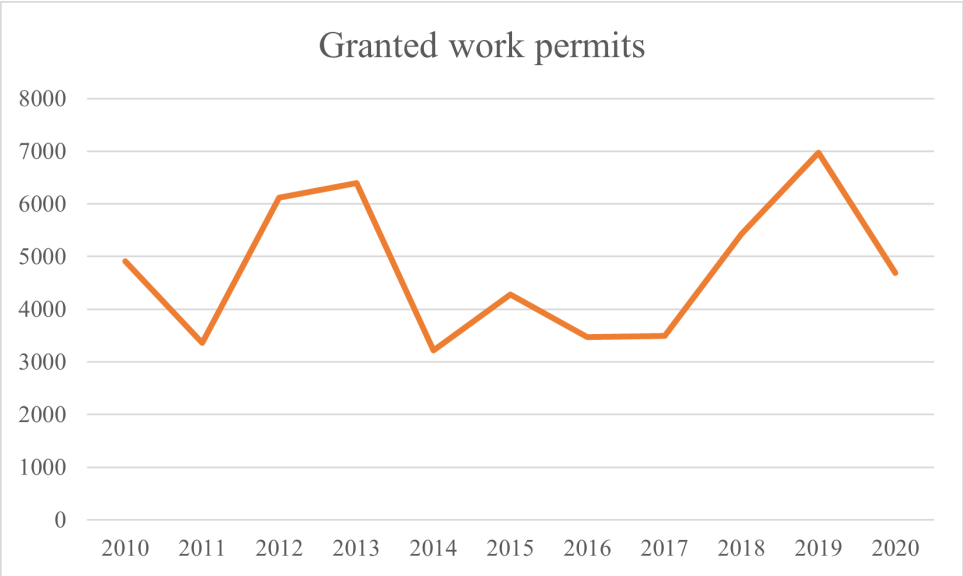


Figure 1.1: Based on data from Swedish Migration Agency (2020)

The actual number of foreign workers within the Swedish agricultural sector is uncertain,

as pointed out by Elmquist (2014). An explanation to this can be that the vast majority of seasonal labour migration comes from within the EU, for which there is no exact data (Svensson et al. 2015). However, one can estimate the number of migrant seasonal workers from outside the EU as they have to apply for a work permit to work in Sweden legally. Figure 1.1 shows the number of granted work permits for the agricultural sector over the past ten years. In 2019, migrant seasonal workers from outside the EU constituted approximately twenty percent of the total hired workforce in the agricultural sector (Statistics Sweden 2020*b*, Swedish Migration Agency 2020). Since the migrant seasonal workers from within the EU are not accounted for in these calculations, it is fair to say that 20 twenty percent is an understatement compared to the actual total number of migrant seasonal workers in the Swedish agricultural sector.

In 2020 the agricultural sector in Sweden experienced a shortage of migrant seasonal workers due to the temporary entry ban (Justitiedepartementet 2020) enforced in March. The shortage is also notable in figure 1.1 but was probably even more significant as workers from within the EU is not accounted for. The temporary ban was eased in April when it was prolonged - allowing workers from outside the EU with a work permit to enter the country. It was a success for the Federation of Swedish Farmers (2020*a*) who had lobbied for it, referring to the guidelines provided by the European Commission (2020). Nevertheless, the resulting harvest for 2020 was considered a normal one for grain production Lantmännen (2020) and vegetables (Statistics for 2020 not yet published, but confirmed through personal communication with an official at the Swedish Board of Agriculture, 19 April 2021). Hence one can wonder how necessary migrant seasonal labour is to the agricultural sector, whether it is as important as the quick action from the Federation of Swedish Farmers (Federation of Swedish Farmers 2020*a*) suggests or if it is of no importance at all.

According to the union president at the Federation of Swedish Farmers, Borgström (2020), the Swedish population seems to disregard work within the agricultural sector. Therefore farmers have to look abroad for seasonal labour. This point of view is not shared by Svensson et al. (2015), who, in their review of the existing literature on the working environment and working conditions for migrant seasonal workers, suggests that it is for purely economic reasons.

This thesis aims to investigate whether migrant seasonal workers have an impact on employment within the agricultural sector and, if so, in what direction. To estimate this relationship, I used panel data from 2010 to 2019 and fitted a fixed-effects model. In theory, the direction of the potential impact could be both positive or negative (Borjas & Van Ours 2010). It depends on whether seasonal workers make farmers able to focus on more advanced tasks or push away domestic workers. To my knowledge, there does not exist any research on the subject in a Swedish context. With this thesis, I hope to

shed much-needed light on the question and hopefully increase the knowledge of migrant seasonal workers in the agricultural sector.

The structure of this thesis is as follows. Chapter two presents a background regarding migrant seasonal workers in the agricultural sector and the research questions for this paper. In the third chapter, the data and method are described and then the results are presented. Chapter four provides a discussion regarding the results, dependence on migrant seasonal workers, and the limitations of this thesis and future research. Lastly, chapter five concludes the thesis.

# Chapter 2

# Background

In this chapter, a background of migrant seasonal workers in the Swedish agricultural sector is presented. Studies regarding the work and living conditions for migrant seasonal workers are discussed, particularly the study of Campbell (2019). Lastly, the research questions for this thesis are presented.

## 2.1 Migrant seasonal workers in the agricultural sector

Sweden has a long history when it comes to importing seasonal workers in the agricultural sector. After the Second World War, when agriculture became widely modernized, the Swedish government signed an agreement with the Hungarian government to allow Hungarian workers to come and work in the Swedish agricultural sector (Svensson et al. 2015). Although Sweden no longer has this agreement with Hungary, as it was terminated in 1949, the agricultural sector is still dependent on foreign labour (Zachrison et al. 2015).

As pointed out by both Svensson et al. (2015) and Zachrison et al. (2015) it is hard to know the exact origin and quantity of migrant seasonal workers in Sweden today, as the majority comes from within the EU. One of the EU's corners pillars is that citizens can work in any EU country without a work permit (European Union 2020). The geographical placement of migrant seasonal workers in Sweden is easier to understand. Most seasonal workers are employed within the labour-intensive vegetable production in the south and berry picking in the north. According to Svensson et al. (2015) the work is characterised by low status, it is physically demanding, low wage levels and lack of permanent employment. Svensson et al. (2015) also argues that these characteristics are the reason why it is hard to attract domestic workers. The Swedish workforce shows little interest in working

under such poor and sometimes illegal[1]working conditions (Svensson et al. 2015). Poor working conditions for seasonal and migrant workers are well investigated in an international context. Landry et al. (2021) describes the systematic exploitation of temporary workers in Canada, and the same pattern is found in Norway (Rye & Andrzejewska 2010), Australia (Ariyawansa 2018), Germany and Poland (Fiałkowska & Matuszczyk 2021).

Axelsson & Hedberg (2018) describe the difficulties associated with legislative power for the migrant workers in the wild berry industry in Sweden. They focus on employees who are *"posted"* across borders by transnational subcontractors. For example: one farmer in Sweden has an agreement with a staffing company in Poland. The employees are then hired in Poland, but they work in Sweden. These employees' terms and conditions are partly determined by the regulatory framework in the country from which they are sent. Rather than the one they are working in, making these employees vulnerable for exploitation (Axelsson & Hedberg 2018). In her PhD thesis, Krifors (2017) interviews people who actively work as company managers in the wild berry industry in Sweden. These people describe an industry with vague and ever-shifting legislation. The supply chain described by Krifors (2017) with several agents in different countries with different labour laws depicts a laborious systems where the protection and responsibility of the berry pickers are blamed on *"somebody else"*. It is in line with the concerns raised by Martin (2006), that the vast majority of migrant seasonal workers lack worker status and labour protection.

In 2019 Campbell published the article *Harvest labour markets in Australia: Alleged labour shortages and employer demand for temporary migrant workers*, where he questioned the alleged labour shortage making farmers hire foreign harvest workers. He emphasizes that a shift towards more temporary labour is associated with short-term gains for the employer but warns of three types of risks. Firstly, exploitation of the seasonal workers. Secondly, disadvantages for the economy and society and, lastly, displacement of Australian workers. He states that:

> *Particularly problematic is the downward trend in wages and working conditions, largely unfolding outside the bounds of Australian labour law.*

The development in Australia has been encouraged by the farm lobby and other low-wage sectors to enable farmers to employ foreign seasonal workers (Campbell 2019). However, it is difficult to translate Campbell's findings onto a Swedish context. Nonetheless, the Federation of Swedish Farmers seems to promote the same idea (Borgström 2020) as their Australian colleges - that the lack of a domestic labour makes farmers employ migrant seasonal workers and not because they are cheaper to employ. A recent study by Kandilov

[1]According to Svensson et al. (2015) there are reasons to believe that migrant seasonal workers within the Swedish agricultural sector lives and works under unacceptable circumstances, such as: poor housing and deficient hygiene, increased accident risk, exposure to health hazardous chemicals, ergonomic problems, risk of threats and violence, discrimination, harassment, lack of support from society such as health care and legal aid, long working hours and low wages.

& Kandilov (2020), regarding the US agricultural sector, suggests that if the minimum wage were raised, it would not affect the total expenditure on hired agricultural workers. They estimated the long-run elasticity of total agricultural employment to the minimum wage of about -0.40. However, Kandilov & Kandilov (2020) suggest that the increased minimum wage could lead to higher capital investment. Therefore, it is resulting in a total net gain for the agricultural sector.

## 2.2 Research questions

One may wonder how the Swedish agricultural sector should be organised to handle the decreasing number of farmers. Should it continue to rely on migrant seasonal workers, or should it try another approach? In order to investigate the potential relationship between seasonal workers and the employment in the agricultural sector, I will look to answer the following research questions:

- To what extent does migrant seasonal workers affect the employment within the Swedish agricultural sector?
- Is the dependence on migrant seasonal workers beneficial for the Swedish agricultural sector?

# Chapter 3

# Methodology

This chapter will describe the data and model used to estimate the impact of migrant seasonal workers on employment in the agricultural sector. The data used in this thesis, described in section 3.1, is panel data from 2010 until 2019. I have used two different data sets, one on the county-specific level and one on the municipality-specific level. The model used to estimate the relationship between migrant seasonal workers and employment is a fixed-effect model, as the regional specific effects are thought to be fixed (Davidson et al. 2004). More information regarding the model is found in section 3.2, and lastly in section 3.3, I present the results.

## 3.1 Data

The employment data used in this thesis is taken from the Swedish Occupational register (Statistics Sweden 2020*b*). The data shows the number of employees by region of work, industry and year. This data only shows the people who are *employed*. Those who are self-employed does not show in these figures. Furthermore, those who work without official employment are not included. In figure 3.1 the number of employed persons in the agricultural sector from 2010 to 2019 is shown.

As mentioned in the introduction and background, there exists no complete data on the number of migrant seasonal workers in Sweden. However, the Swedish Migration Agency (Swedish Migration Agency 2020) provides statistics for the number of granted work permits for non-EU workers. This data will serve as an estimate for the number of seasonal workers. The classification used by the Swedish Migration Agency only connects animal breeders and keepers, forestry workers, market gardeners and crop growers, mixed crop and animal producers to a specific region. The vast majority of migrant seasonal workers have not been defined as one of these groups. Instead, they are labelled as *helpers* with little or no education or pre-knowledge. This creates a problem since these seasonal workers, labelled as *helpers*, are not assigned to a region. In order to address this issue, I contacted

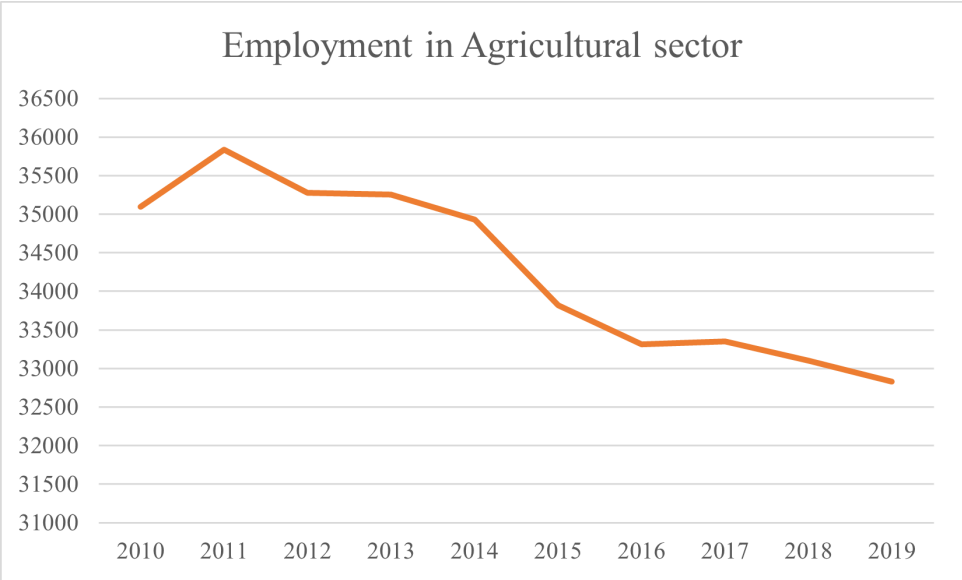


Figure 3.1: Based on data from Statistics Sweden (2020*b*)

the Statistical Support at the Swedish Migration Agency (personal communication, 28 April, 2021). They provided me with more detailed data, with seasonal workers assigned to counties and municipalities.

The data for the period 2010-2014 was inconclusive. If one compares the data provided by the Statistical Support with the data available on the Swedish Migration Agency's website (Swedish Migration Agency 2020), see figure 3.2, the number of granted permits for 2010-2014 is substantially higher than reported by the Statistical Support (personal communication, 28 April, 2021). As of today, an explanation for these differences has not

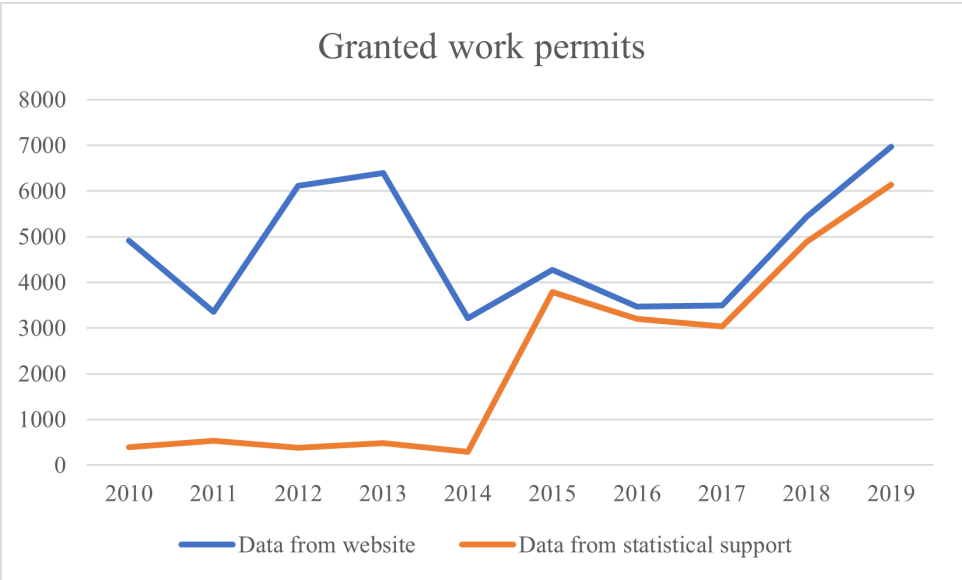


Figure 3.2: Based on data from Swedish Migration Agency (2020)

been given. It appears that between 2010 and 2014, the *helpers* have not been included in

the data provided by the Statistical Support (personal communication, 28 April, 2021). I choose to use this data since it accurately assigns seasonal workers to the correct county or municipality, despite that the quantity of workers for the period of 2010-2014 is questionable. To address this problem, I will adjust the model to put more emphasize on the period with more data.

Two different covariates were included to estimate the effect of seasonal workers on employment as accurate as possible. The number of animals and the number of corporations within the agricultural sector are thought to affect employment in the agricultural sector. Although the care of animals has been made more efficient through various machines, workers are still needed to take care of animals. The data for animals was collected from Swedish Board of Agriculture (2020*b*) for counties, and Swedish Board of Agriculture (2020*a*) for municipalities. For counties, it was available for all years from 2010 to 2019. For municipalities, the data of the number of animals was only registered every third or fourth year. Therefore I calculated the average annual growth rate to find estimates of the number of animals in the years between.

The number of corporations within the agricultural sector has decreased (Karlsson 2017, Statistics Sweden & Swedish Board of Agriculture 2020), which could mean that more workers are employed rather than self-employed. At the same time, the economies of scale within the agricultural sector affect in the opposite direction. The size of the farms left increases but not the total agricultural land. With larger farms, one can use larger and more efficient machines rather than more manual labour. Hence, the number of corporations is thought to have a relationship with employment, though its direction is unclear. One might regard the number of corporations as a dependent variable, creating endogeneity in the regression analysis. However, the results presented in this thesis are not sensitive to the exclusion of the variable, which indicates that it appears as an independent variable in the regression. The number of corporations within the agricultural sector was collected through Statistics Sweden (2020*a*) for counties as well as municipalities.

## 3.2 Method

To analyse the panel data, a fixed-effect model was estimated. The choice of a fixed-effect model was straight forward, as the data was panel data, and the regional specific effect was thought to be fixed over time. The regional fixed effects estimation rests on the assumption that the unobserved regional effect, $A_i$ in equation 3.1, appears without a time subscript in a linear model for $E(Y_{0,i,t}|A_i, X_{i,t}, t)$. In this case, this means that each county or municipality has individual unobserved characteristics that affect employment in the agricultural sector. In other words, each county and municipality have different

fixed conditions for farming.

$$Y_{i,t} = \alpha + \beta E_{i,t} + \lambda_t + \gamma A_i + \delta X_{i,t} + \psi I_{i,t} + \varepsilon_{i,t} \tag{3.1}$$

Year dummies, $\lambda_t$, were included to control for the time trend. The covariates, the number of animals and corporations in each county and municipality, are depicted as $X_{i,t}$. This regression, equation 3.1, was run with the variable of interest $E_{i,t}$, the number of migrant seasonal workers, on $Y_{i,t}$, the number of people employed in the agricultural sector. As mentioned in section 3.1, the data on seasonal workers was inconclusive. In the data set provided by the Statistical Support the number of granted permits for migrant seasonal workers, for 2010-2014, was substantially lower than the quantities reported on the Swedish Migration Agency's website (Swedish Migration Agency 2020). An interaction variable, $I_{i,t}$, consisting of 2010-2014, was included to address this. Adding $I_{i,t}$, the potential effect seasonal workers have on employment in the agricultural sector is allowed to differ between the two periods, 2010-2014 and 2015-2019. In addition to equation 3.1, a second weighted regression was run. I used data from Statistics Sweden (2020*a*) of net sales in the agricultural sector to calculate weights of the size of the agricultural sector in each region with respect to the whole country. By doing so, the relative importance of more significant agricultural regions is scaled up. The reasoning behind this scaling is that a fixed effect model measures the variation within regions. By scaling up the importance of regions with a relatively large agricultural sector, the variation driving the effect is more apparent. These two regressions were also performed on only the period of 2015-2019 as the data for granted permits for migrant seasonal workers during that period was considered more accurate. All the variables in all the regressions were logged, and the results can therefore be interpreted as elasticities. The regressions were also run without logging the variables and these results where in line with the ones presented in the next section.

Lastly, neighbouring regions are thought to affect one another, creating heteroscedastic errors. Since agricultural sectors can be intertwined over regions, e.g. with workers living in one region and working in another. I confirmed this theory through a Breeusch-Pagan/Cook-Weisberg test. Therefore, the error terms, $\varepsilon_{i,t}$, were clustered to account for the heteroscedasticity (Hoechle 2007).

## 3.3 Results

In this section I present a summary of the results in table 3.1 and 3.2. The full regression results can be found in Appendix A, figure A.1 and A.2.

### 3.3.1 Counties

In table 3.1, regression I and II are represent the full data set where as regression III and IV represent the period of 2015-2019. In regression II and IV, weights are used to give more emphasize the regions with larger agricultural sectors. The interaction variable is

Table 3.1: Summary of results for Counties

| Regression | I | II | III | IV |
|---|---|---|---|---|
| Permit (SE) | 0.000618<br>(0.00300) | 0.00150<br>(0.00287) | 0.00200<br>(0.00240) | 0.00359*<br>(0.00209) |
| Animals (SE) | 0.0118<br>(0.0143) | 0.00435<br>(0.0135) | 0.0197<br>(0.0137) | 0.00863<br>(0.0131) |
| Corporations (SE) | 0.475***<br>(0.0916) | 0.380***<br>(0.0835) | 0.184<br>(0.116) | 0.0830<br>(0.0981) |
| Interaction (SE) | -0.00741*<br>(0.00422) | -0.0112***<br>(0.00338) | - | - |
| Observations | 210 | 210 | 105 | 105 |
| Regions | 21 | 21 | 21 | 21 |

significant for regression I and II, indicating a statistically significant difference between 2010-2014 and 2015-2019. Although the difference is of considerate size, this result was expected, see the discussion regarding the data in section 3.1. In the weighted regression IV there is a significant result on the permit variable. According to this result, would a one percent increase in granted permits constitute an increase in employment by 0.004 percent.

### 3.3.2 Municipalities

In table 3.2, regression I and II are represent the full data set where as regression III and IV represent the period of 2015-2019. In regression II and IV weights are used to give more emphasize on the regions with larger agricultural sectors. For municipalities, no significant result of interest is found. The covariates in all regression are significant and positive, but neither the interaction nor the permit variable is significant. Notable is that the coefficients for the permit-variable are of similar size in regression I, II and III. However, in the weighted regression on 2015-2019, the coefficient is almost reduced in half.

Table 3.2: Summary of results for Municipalities

| Regression | I | II | III | IV |
|---|---|---|---|---|
| Permit (SE) | 0.00431<br>(0.00381) | 0.00380<br>(0.00341) | 0.00323<br>(0.00376) | 0.00174<br>(0.00336) |
| Animals (SE) | 0.0309***<br>(0.00891) | 0.0293***<br>(0.00813) | 0.0304**<br>(0.0126) | 0.0215*<br>(0.0116) |
| Corporations (SE) | 0.136***<br>(0.0212) | 0.140***<br>(0.0203) | 0.140***<br>(0.0303) | 0.177***<br>(0.0310) |
| Interaction (SE) | -0.00737<br>(0.00821) | -0.00103<br>(0.00738) | - | - |
| Observations | 2 528 | 2 528 | 1 271 | 1 271 |
| Regions | 272 | 272 | 269 | 269 |

# Chapter 4

# Discussion

In this chapter I will discuss the result and to what extent the findings answer my research questions. Furthermore I will investigate the dependence on seasonal workers in the agricultural sector and discuss what future research that might be interesting.

## 4.1 Regarding the results

Neither the regressions from the county nor the municipality dataset returned any major significant result. In the regressions on the county dataset, only the corporation- and the interaction-variable had a significant result on the whole dataset. With this result, it is reasonable to question the specifications of the model used. However, my opinion is that the number of observation is too low in order for the model to estimate the within variation, which a fixed effect model does. The validity of the result from the county dataset is thought to be questionable.

For the regressions on municipalities, the number of observations is considerably higher than for counties since there are more municipalities than counties. Therefore, the validity of these results is assumed to be larger. Furthermore, the fixed effect model generates reasonable results for the municipality dataset.

Previously, I discussed the possible relationship between the number of corporations and employment in the agricultural sector. According to the results on the municipality dataset, it seems that more corporations generate more employed people in the agricultural sector. These results are in line with the recent structural transformation within the Swedish agricultural sector, with decreasing employment and fewer farms (Karlsson 2017, Statistics Sweden & Swedish Board of Agriculture 2020, Swedish Board of Agriculture 2021). Thus, as the number of farms decrease but their size increase, fewer people work in in the agricultural sector. The workers are substituted for more extensive and more efficient machines. With machines farmers can utilize the large economies of scale within the agricultural sector and according to Charania & Li (2020) this development will only

increase with further automatization. All this indicates that the structural transformation within the agricultural sector is beneficial for the remaining farmers who can utilize the economics of scale within the agricultural sector, but it also decreases the employment in the sector as a whole.

When it comes to the effect of seasonal workers on employment in the agricultural sector, it is slightly positive but insignificant. It seems as if even though migrant seasonal workers from outside the EU constitute a large share of the total employment in the agricultural sector (20 percent in 2019 (Statistics Sweden 2020*b*, Swedish Migration Agency 2020)), they do not *affect* the employment. Plausibly, migrant seasonal workers from outside the EU operate on an isolated labour market dispatched from the Swedish one. It is similar to what Martin (2006) described in 2006 when he evaluated temporary worker programs. He found that the vast majority of migrant workers operate outside of official work programs. Consequently, workers are more vulnerable to exploitation as they lack worker status and labour protection. The results suggest that a similar pattern can be found in Sweden, as the number of seasonal workers does affect employment in the agricultural sector.

## 4.2 Regarding dependence of migrant seasonal workers

In the summer of 2020, the head of the Federation of Swedish Farmers, Anna Karin Hatt, said that *"the ordinary seasonal workforce is needed"* referring to migrant seasonal workers from abroad (Federation of Swedish Farmers 2020*b*). According to her, the COVID-19 pandemic forced the agricultural sector to develop flexible solutions to replace all international seasonal workers. Instead of viewing 2020 as an extraordinary event, maybe one could take the opportunity to reconsider the dependence on migrant seasonal workers.

Borgström (2020) claims that Swedish farmers do not hire international seasonal workers solemnly because they are cheap. Instead, it is due to the lack of interest to work in the agricultural sector from the domestic labour force. Regardless of the reasoning behind employing seasonal workers from abroad, its effect is not beneficial, according to Svensson et al. (2015). Their review of the existing literature finds that accesses of migrating seasonal workers, which is cheap and durable, affect the agricultural sector in the recipient countries negatively. It has pushed the agricultural sector to become one of the most hazardous and low-paid sectors in the labour market.

The fact that the agricultural sector, in comparison to other sectors, is a low-paid sector, is one of the arguments used by Campbell (2019) when he argues that there is no labour shortage in Australia's agricultural sector. He points out that if a labour shortage were to exist, it should according to economic theory, push up the wages and not down. By the same reasoning, a labour shortage in Sweden would increase the wages of migrant

seasonal workers, and eventually, it would equate to the wage of domestic seasonal workers. However, such development has not occurred in Sweden. Moreover, it indicates that migrant seasonal workers operate on an isolated labour market where the wage and work conditions differ from the official Swedish labour market. By hiring migrating seasonal workers, for whom the payment is relative high compared to their home countries, the agricultural sector lowers their short term cost compared to hiring domestic workers. If this is beneficial for the agricultural sector in the long run is unclear and can be debatable. One could assume that the agricultural sector is interested in changing its status as one of the most hazardous and low-paid sectors (Svensson et al. 2015). Maybe some inspiration can be taken from the study of Kandilov & Kandilov (2020): Even though increased minimum wage is not applicable in a Swedish context, it could perhaps be translated to improved work and living conditions for seasonal workers. As suggested by Kandilov & Kandilov (2020), an increase in standards for seasonal workers does not change the total expenditure on hired agricultural workers. Instead, it leads to decreased employment and higher capital investment, generating a net gain for the agricultural sector. In a Swedish context, this could perhaps be translated to fewer migrant seasonal workers, but those employed will have a decent salary and working conditions. It is up to the Federation of Swedish Farmers to determine what to lobby for to tackle the decreasing employment within the agricultural sector. I do not believe that the dependence of migrant seasonal workers is the future for the agricultural sector.

This thesis suggests that migrant seasonal workers do not affect employment in the agricultural sector. The existing literature raises the question whether the dependence on migrant seasonal workers is *beneficial* for the agricultural sector. The findings of this thesis can not establish whether the dependence is beneficial. However, it does show that the structural transformations taking place in the agricultural sector decreases employment. One can only hope that the Federations of Swedish Farmers takes these thoughts into account when deciding on their lobbying activity for the future.

## 4.3 Regarding limitations and future research

The major limitation of this thesis is data on migrant seasonal workers, as it only shows the number of seasonal workers coming from outside the EU. The reason for this, as mentioned earlier, is that data on migrant seasonal workers from within the EU does not exist. Therefore the numbers of migrant season workers reported in this thesis are assumed to be lower than the actual numbers. Unfortunately, another issue with the data provided by the Statistical Support at the Swedish Migration Service was the inconclusiveness between 2010 to 2014. Nevertheless, I choose to use this data since it regionally assigned migrant seasonal workers to the correct counties and municipalities. With more accurate data for a longer period, it would be possible to check whether the results presented in this

thesis are accurate estimates of the effect of seasonal workers on employment. It is possible that the period used in this thesis is too short and therefore no effect is detected through the fixed effect model. Although, the result presented in this thesis are in line with the limited literature that exist on the subject. One could therefore assume that estimations with data for a longer period would further strengthen the discussion presented in this thesis.

In order to further understand how seasonal workers affect the agricultural sector in Sweden, additional investigations are needed. In the literature I found regarding seasonal workers, the focus has mostly been on work-life and work-environmental aspects. Though this is interesting, I believe that in order to address those issues, one must investigate the dependence on seasonal workers more thoroughly. It might be that these poor conditions are just a result of extreme cost reduction within the agricultural sector. By using cheap foreign seasonal workers, production costs are lowered, but it enables exploitation.

# Chapter 5

# Conclusion

The objective of this thesis was to investigate the two research questions; whether seasonal workers affect employment and if the dependence on seasonal workers is beneficial for the Swedish agricultural sector. Based on the result presented in this thesis, seasonal workers do not affect employment in the agricultural sector. Furthermore, it is not possible to determine whether the dependence on seasonal workers is beneficial for the Swedish agricultural sector. Although the results indicate that the ongoing structural transformation within the agricultural sector decrease employment, whether this is beneficial for the sector or not is out of scope for this thesis.

I argue that there are signs within the Swedish agricultural sector that resembles those described by Campbell (2019). The relatively low wages within the agricultural sector do not support the claims from the interest group of farmers that there is a shortage of labour force. Instead, it is the case that farmers prefer foreign seasonal workers as they are cheaper to employ and they accept a lower standard of working conditions.

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# Appendix A

# Tables

Figure A.1: Regression results Counties

| Regression | I | II | III | IV |
|---|---|---|---|---|
| VARIABLES | Log-employed | Log-employed | Log-employed | Log-employed |
| Log-animals | 0.0118 | 0.00435 | 0.0197 | 0.00863 |
| | (0.0143) | (0.0135) | (0.0137) | (0.0131) |
| Log-permit | 0.000618 | 0.00150 | 0.00200 | 0.00359* |
| | (0.00300) | (0.00287) | (0.00240) | (0.00209) |
| Log-corp | 0.475*** | 0.380*** | 0.184 | 0.0830 |
| | (0.0916) | (0.0835) | (0.116) | (0.0981) |
| Log-inter | -0.00741* | -0.0112*** | | |
| | (0.00422) | (0.00338) | | |
| 2011.year | 0.00521 | 0.00730 | | |
| | (0.0141) | (0.0122) | | |
| 2012.year | -0.0312** | -0.0240* | | |
| | (0.0150) | (0.0130) | | |
| 2013.year | -0.0626*** | -0.0482*** | | |
| | (0.0180) | (0.0158) | | |
| 2014.year | -0.0717*** | -0.0603*** | | |
| | (0.0177) | (0.0156) | | |
| 2015.year | -0.145*** | -0.134*** | | |
| | (0.0223) | (0.0193) | | |
| 2016.year | -0.176*** | -0.162*** | -0.0266*** | -0.0239*** |
| | (0.0247) | (0.0215) | (0.00952) | (0.00827) |
| 2017.year | -0.187*** | -0.174*** | -0.0310*** | -0.0283*** |
| | (0.0269) | (0.0233) | (0.0112) | (0.00970) |
| 2018.year | -0.201*** | -0.187*** | -0.0386*** | -0.0349*** |
| | (0.0280) | (0.0246) | (0.0123) | (0.0110) |
| 2019.year | -0.234*** | -0.212*** | -0.0631*** | -0.0503*** |
| | (0.0310) | (0.0274) | (0.0155) | (0.0138) |
| Constant | 4.512*** | 5.319*** | 5.927*** | 6.923*** |
| | (0.563) | (0.540) | (0.677) | (0.614) |
| Observations | 210 | 210 | 105 | 105 |
| R-squared | 0.497 | 0.507 | 0.236 | 0.228 |
| Number of regions | 21 | 21 | 21 | 21 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure A.2: Regression results Municipalities

| Regression | I | II | III | IV |
|---|---|---|---|---|
| VARIABLES | Log-employed | Log-employed | Log-employed | Log-employed |
| | | | | |
| Log-animals | 0.0309*** | 0.0293*** | 0.0304** | 0.0215* |
| | (0.00891) | (0.00813) | (0.0126) | (0.0116) |
| Log-permit | 0.00431 | 0.00380 | 0.00323 | 0.00174 |
| | (0.00381) | (0.00341) | (0.00376) | (0.00336) |
| Log-corp | 0.136*** | 0.140*** | 0.140*** | 0.177*** |
| | (0.0212) | (0.0203) | (0.0303) | (0.0310) |
| Log-inter | -0.00737 | -0.00103 | | |
| | (0.00821) | (0.00738) | | |
| 2011.year | 0.00891 | 0.0161 | | |
| | (0.0138) | (0.0125) | | |
| 2012.year | -0.00699 | -0.00749 | | |
| | (0.0138) | (0.0125) | | |
| 2013.year | -0.0158 | -0.0198 | | |
| | (0.0140) | (0.0127) | | |
| 2014.year | -0.0394*** | -0.0386*** | | |
| | (0.0139) | (0.0128) | | |
| 2015.year | -0.0736*** | -0.0737*** | | |
| | (0.0143) | (0.0131) | | |
| 2016.year | -0.0883*** | -0.0927*** | -0.0167 | -0.0209** |
| | (0.0146) | (0.0134) | (0.0108) | (0.00996) |
| 2017.year | -0.0957*** | -0.0946*** | -0.0233** | -0.0239** |
| | (0.0150) | (0.0137) | (0.0112) | (0.0103) |
| 2018.year | -0.100*** | -0.0997*** | -0.0285** | -0.0303*** |
| | (0.0153) | (0.0140) | (0.0116) | (0.0105) |
| 2019.year | -0.119*** | -0.120*** | -0.0465*** | -0.0513*** |
| | (0.0157) | (0.0144) | (0.0121) | (0.0111) |
| Constant | 3.930*** | 4.048*** | 3.853*** | 3.936*** |
| | (0.105) | (0.102) | (0.152) | (0.152) |
| | | | | |
| Observations | 2,528 | 2,528 | 1,271 | 1,271 |
| R-squared | 0.073 | 0.088 | 0.039 | 0.047 |
| Number of regions | 272 | 272 | 269 | 269 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1